Approach to Masses of the Head and Neck

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Objectives

- Recognize when practitioners should worry about head and neck adenopathy
- Identify what are common serious causes of cervical lymphadenopathy and neck masses
- Understand how location of a neck mass guides differential dx
- Identify indications warranting a biopsy of a neck mass

Neck masses

15 yr old male presents with a 3 cm neck mass for 3 weeks

67 yr old female presents with a 3 cm neck mass for 5 weeks

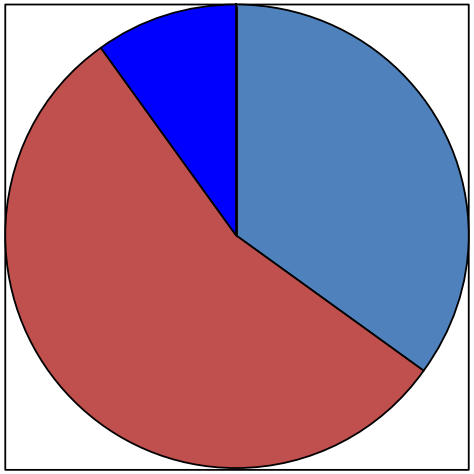
Why are these patients different?
What information do you need to obtain?

Neck Mass - History

What is the AGE of patient?

Etiology of a neck mass is most closely linked to age

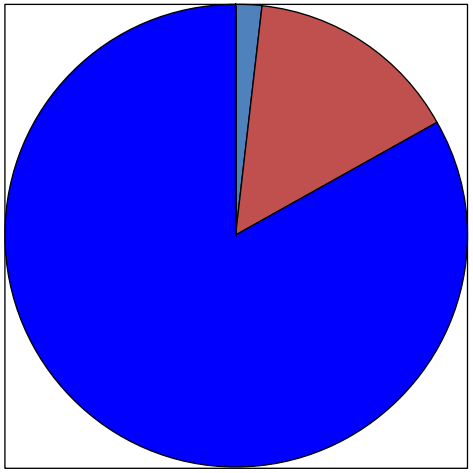
Neck mass etiologies by age



Pediatric
(0-15 y)

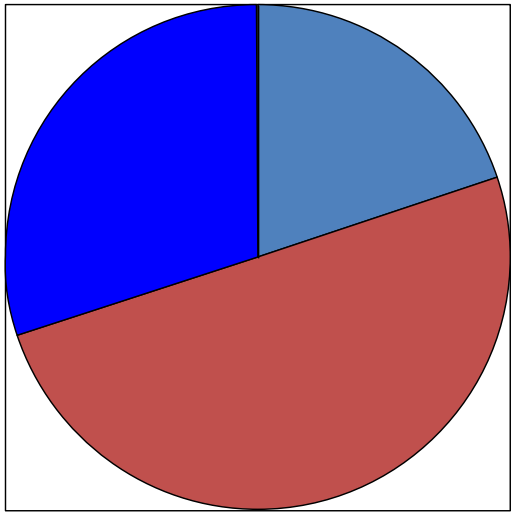
congenital
inflammatory
neoplastic

Peds ~ 80-90% benign



congenital
inflammatory
neoplastic

Adult >40 y



Adolescent
(16-40 y)

congenital
inflammatory
neoplastic

Adult ~ 80% neoplastic
(except thyroid masses)

80% of those are malignant
(except thyroid and parotid masses)

Neck Mass - History

AGE of patient? : etiology most closely linked to age

What is the LOCATION of mass? :
Location is a key factor in developing differential diagnosis

Any new lateral neck mass in an adult > 40 yrs old is likely to be malignant

Many upper aerodigestive tract cancers present with the chief concern of a painless neck mass

Neck anatomy

Neck triangles

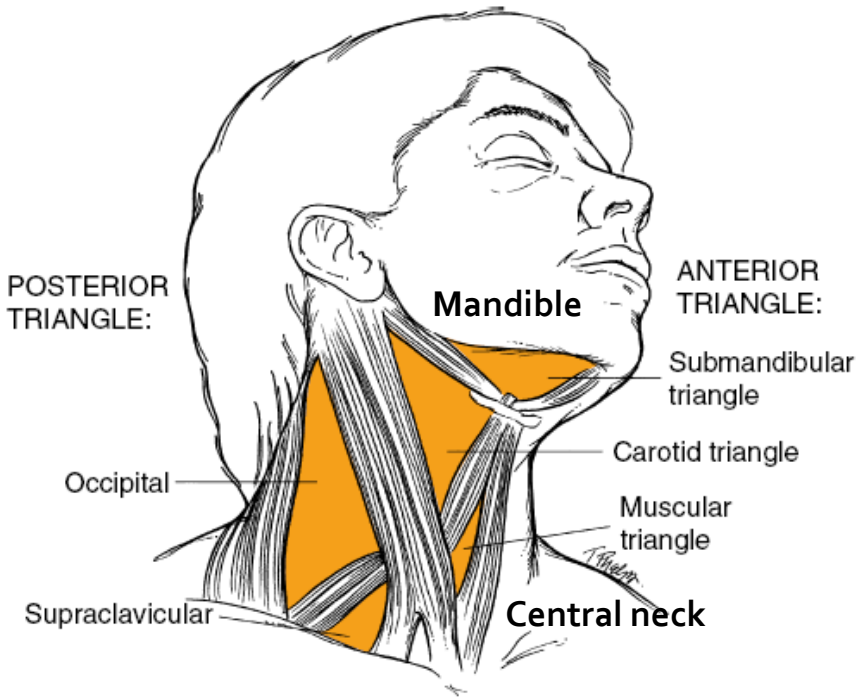
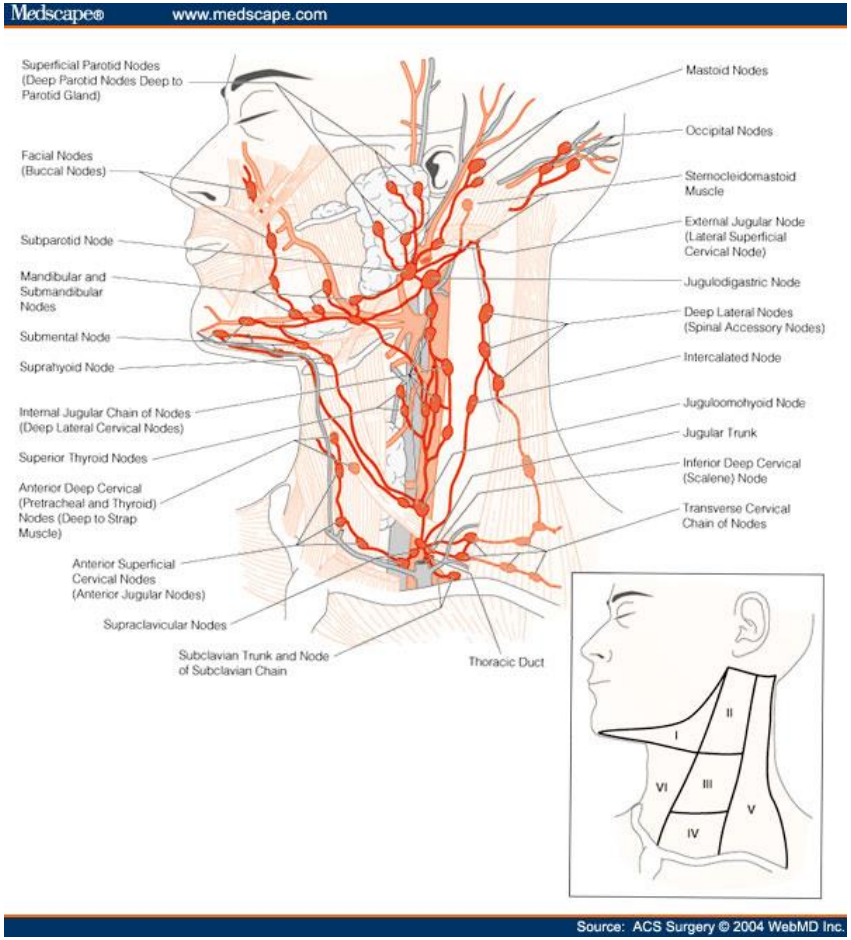


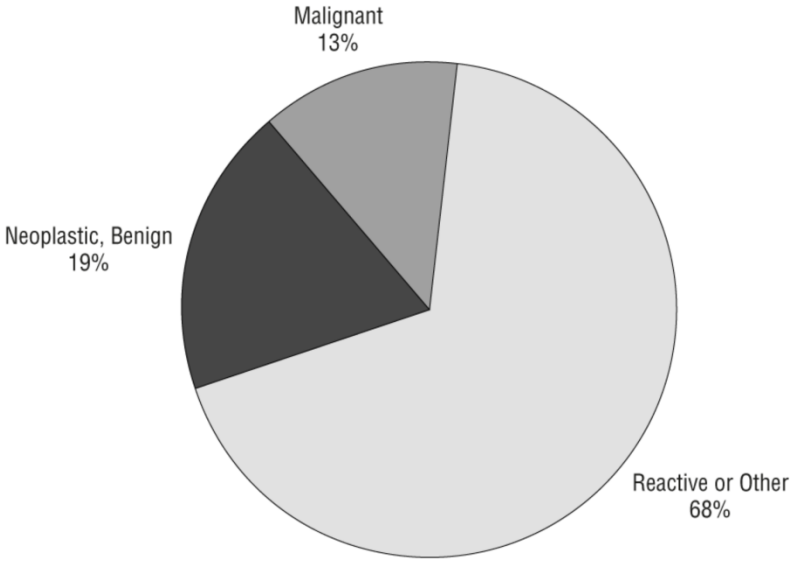
Figure 8-2. Triangles of the neck. The anterior triangle is divided from the posterior triangle by the sternocleidomastoid muscle.

Cummings et al. Otolaryngology-HNS, 5th ed

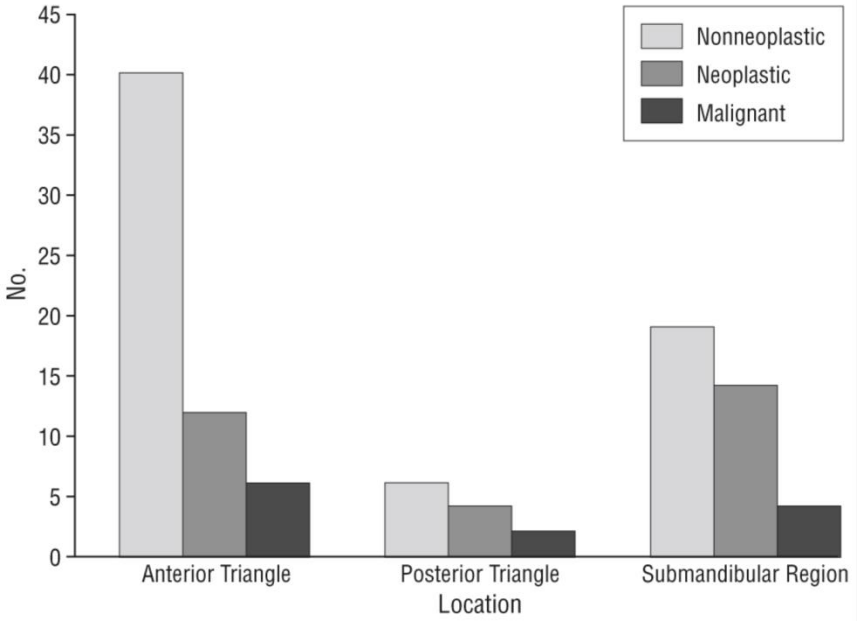
Cervical lymph nodes



Predictive Factors for Neoplasia and Malignancy in a Neck Mass



Final diagnoses for cervical masses



Distribution of neoplastic and malignant masses by location

Bhattacharyya, N. Arch Otolaryngol Head Neck Surg. 1999;125(3):303-307

Neck Mass - History

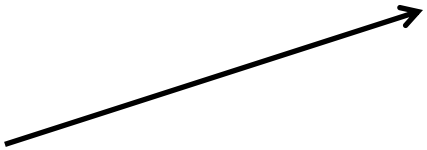
AGE of patient?
Location of mass?

Duration?: > 2-4 wks
Growth pattern? : worrisome if growing
Pain? : most metastatic nodes are painless
Recent infection? : cervical lymphadenitis more likely
Other similar masses?
Exposures? : sick contacts, travel, pets/animals , h/o TB
Prior trauma or surgery in that area

Neck mass - History

Associated symptoms?

- Dysphagia
- Odynophagia/sore throat
- Hoarseness
- Otalgia
- Dyspnea/stridor
- Constitutional symptoms



fever/chills
fatigue
weight loss
night sweats

flushing
palpitations
elevated BP

Risk factors for malignancy:

- smoking
- alcohol
- prior XRT to head and neck
- other malignancy, including skin cancer*
- immunosupression
- family hx
  - thyroid, lymphoma

* Must r/o malignancy in any patient with facial or parotid mass with an associated facial nerve weakness or paralysis

Neck mass - exam

Location helps guide differential dx

- Lateral neck most common site for metastatic disease from UADT
  - upper neck anterior/deep to SCM
- Midline neck masses likely related to thyroid, elevates with swallowing

Concerning features:

- any abnormality in other area of head and neck
  - skin/scalp/ear lesions, mucosal lesion of nasal cavity, oral cavity, pharynx, larynx

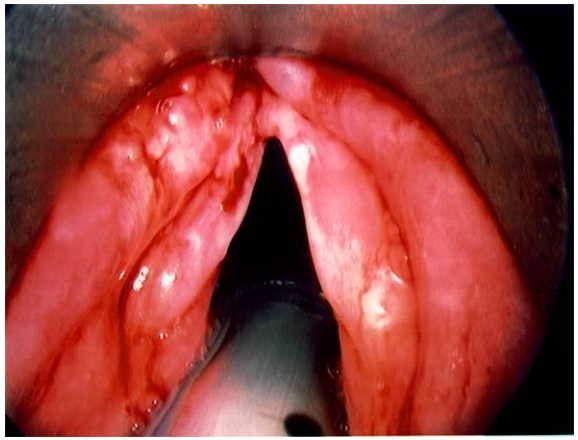
- hard mass
- fixation to surrounding structures (skin, SCM, mandible)
- single, asymmetric node/mass ~ 1.5 cm
- mass in posterior neck or supraclavicular fossa
- neurologic abnormalities (cranial nerves)
- multiple rapidly growing nodes may suggest lymphoma

Concern for abscess warrants referral to ENT possible I & D

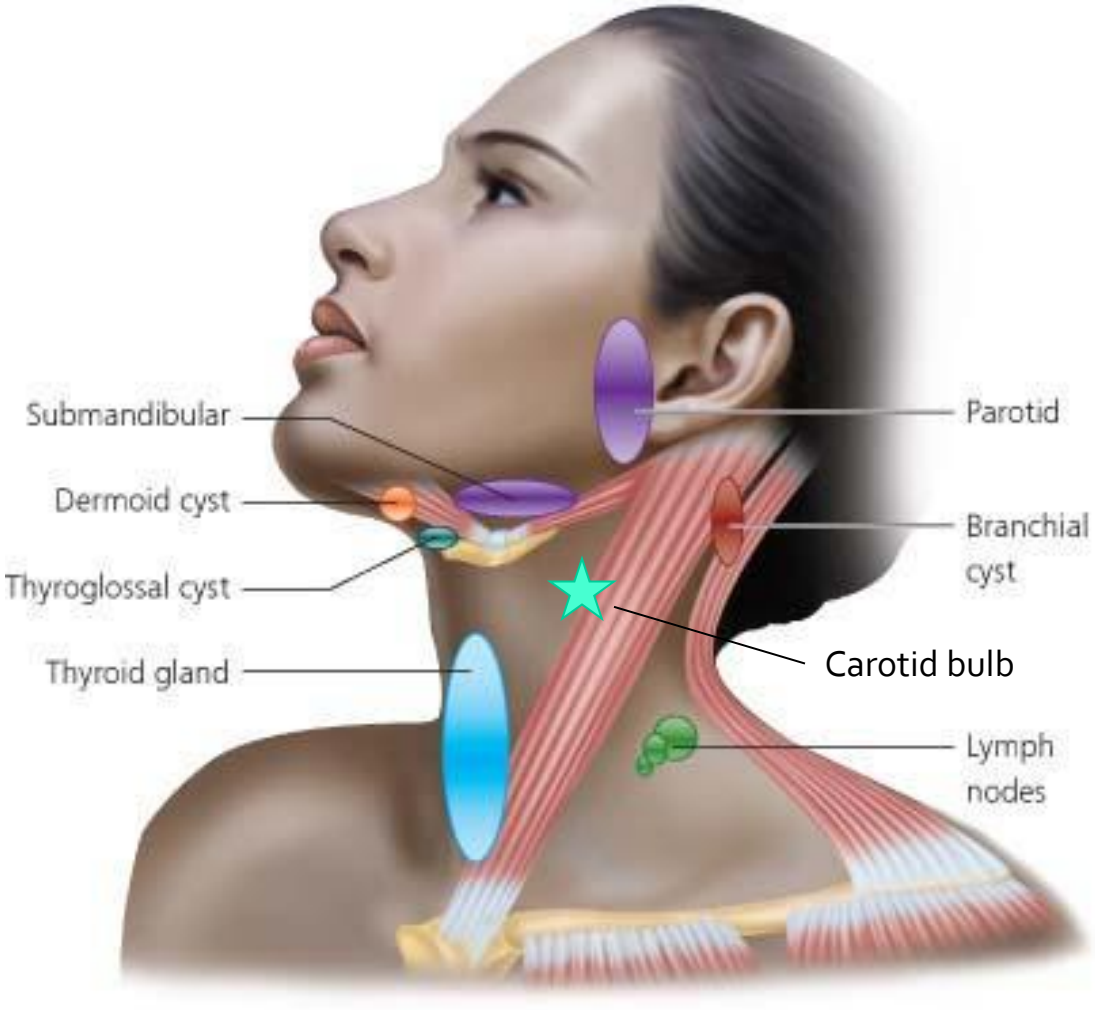
Neck mass - exam

Head and neck examination not complete without visualization of all mucosal surfaces of upper aerodigestive tract in patient with concern for primary head and neck malignancy--> ENT referral

•Waldeyer's ring: tonsils, base of tongue (oropharynx), nasopharynx
•hypopharynx
•larynx



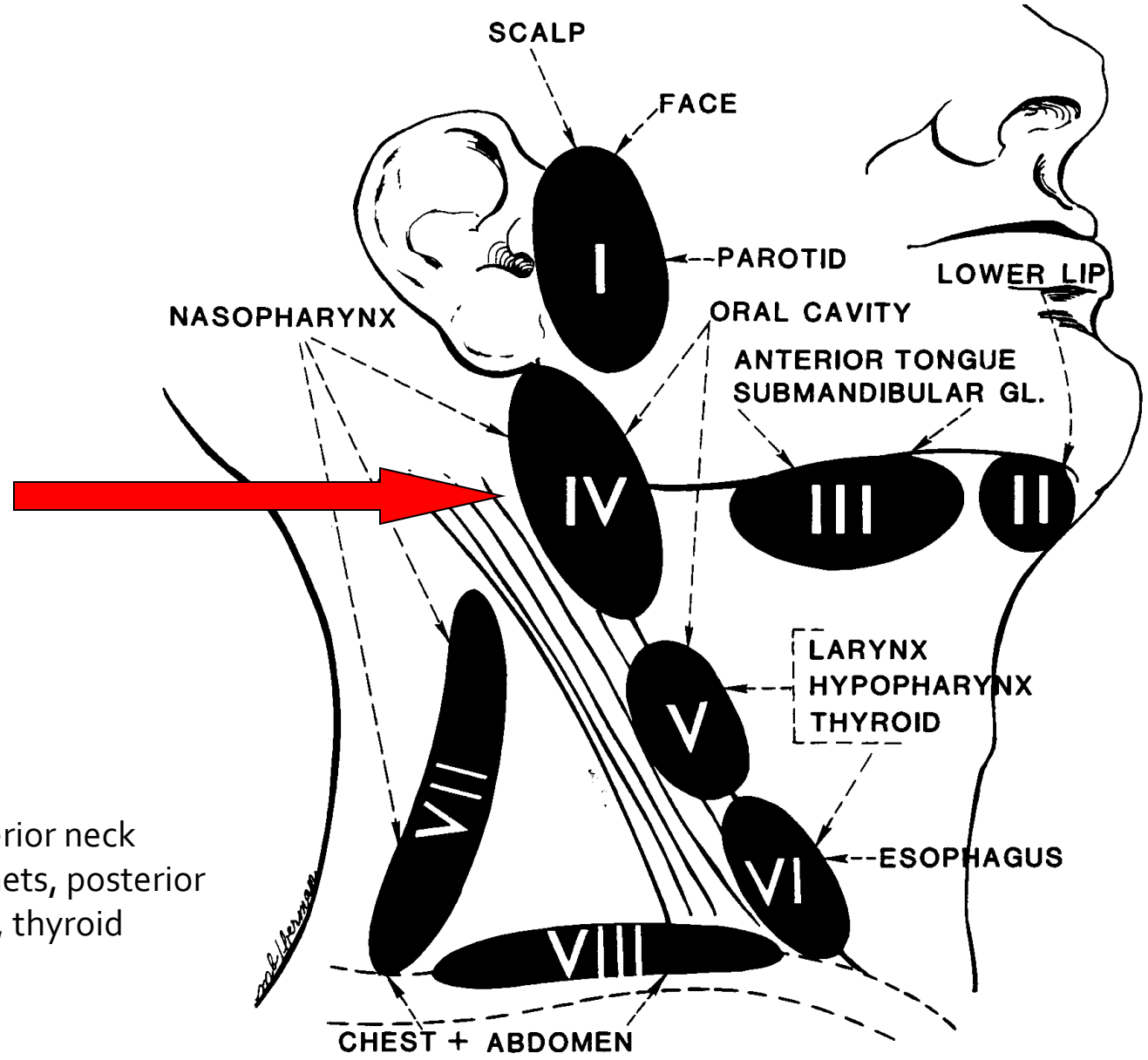
Common neck lumps and locations



Roland N , and Bradley P J BMJ 2014;348

Lymphatic drainage of head and neck

Majority of mets in neck are to upper deep neck nodes



Posterior neck
NP mets, posterior scalp, thyroid

GI, lung, GU

Neck Masses – Differential Dx

Inflammatory/infectious
- lymphadenopathy/lymphadenitis → LN > 1.5 cm
  bacterial, viral, fungal, parasitic
  can become neck abscess
- infectious granulomatous disease
  TB, atypical mycobacteria, cat scratch
- non-infectious granulomatous disease
  sarcoidosis, Kawasaki, Castleman, Kikuchi, Kimura
- sialadenitis/sialolithiasis

Congenital
- branchial cleft cysts
  very rare in adults >40
- laryngocele

Traumatic

Vascular

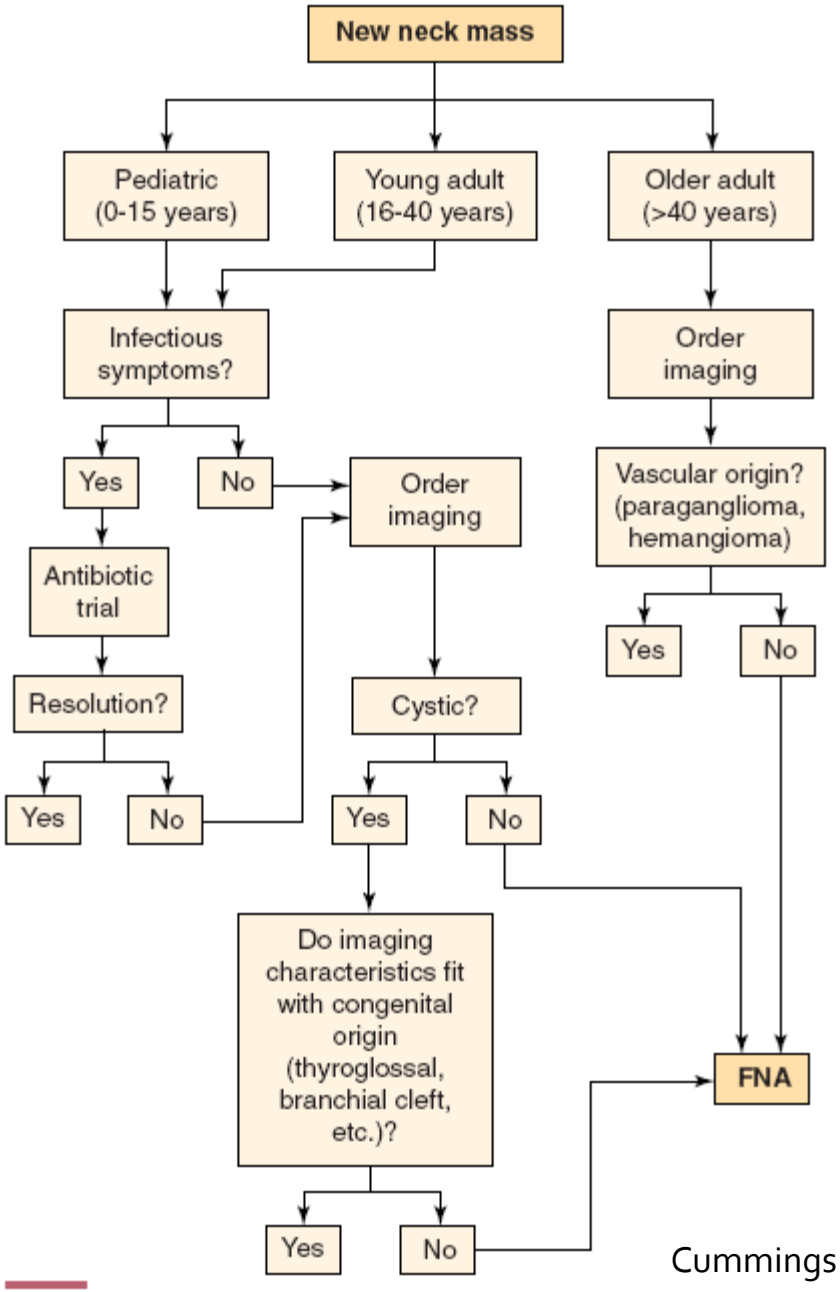
Neoplastic
- metastatic disease
  usually from lesion of mucosa of upper aerodigestive tract , skin

- primary neoplasms
  - lymphoma
  - thyroid
  - salivary gland
  - neurogenic
  - paraganglioma
  - lipoma
  - sarcoma
  - others

Most inflammatory adenopathy is self-limited and will resolve without treatment

Neck masses

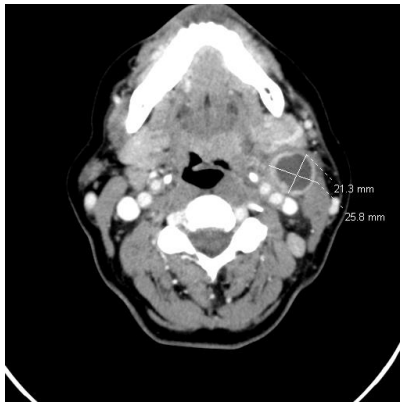
Roland N , and Bradley P J BMJ 2014;348:bmj.g1078



Cummings et al. Otolaryngology-HNS, 5th ed

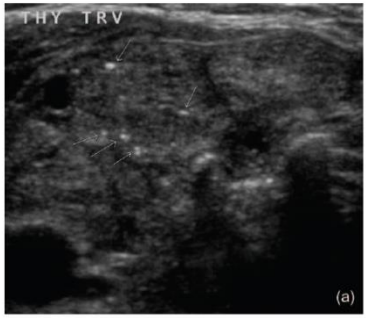
Figure 116-2. Diagnostic schema for a new neck mass.

Imaging of neck masses



CT neck with contrast
- study of choice – >skull base to clavicles
- evaluation of mucosal surfaces, neighboring structures, detailed 3-d anatomy, enhancement, necrosis
- excellent bony resolution

Ultrasound: best for thyroid lesions, pediatric pts
Can distinguish cystic vs solid, guide biopsy



MRI with contrast:
- best soft tissue resolution, useful for salivary glands, concerns for nerve enhancement
- pts with iodinated contrast allergy

Other imaging studies:
- Pet/CT in pts with documented malignancy, staging or restaging
- CT or MR angiography in pts with vascular lesions
- no role for plain films

Neck mass biopsy

Fine needle aspiration is preferred method of biopsy

- safe, well-tolerated, can distinguish inflammatory vs neoplastic process, helps direct management
- can perform in pediatric patients

Indications for FNA:

•single asymmetric node >1.5 cm
•persistent enlarged node without prior signs of active infection
•persistence after trial of antibiotics and observation >2-4 wks
•increasing size of mass
•If concerned about vascular lesion, can obtain FNA after imaging studies

FNA success at establishing diagnosis of neck mass ~ 95%
Success at diagnosing malignancy ~ 95%
Success at diagnosing benign process ~ 87%

Amedee et al, Laryngoscope 2001;111:1551-57

Neck mass biopsy

Fine needle aspiration is preferred method of biopsy

- try to avoid incisional biopsy if concerned about mass being metastatic SCC
- excisional biopsy may be necessary if FNA is non-dx, concerning for lymphoma or other malignancy
  - flow cytometry can be obtained in evaluation of possible lymphoma
  - negative FNA cannot completely possibility of lymphoma
- can increase yield by U/S guidance or core biopsy
- can send material for gram stain and cultures
- may not be able to diagnose some thryoid malignancies on FNA alone

Thyroid masses

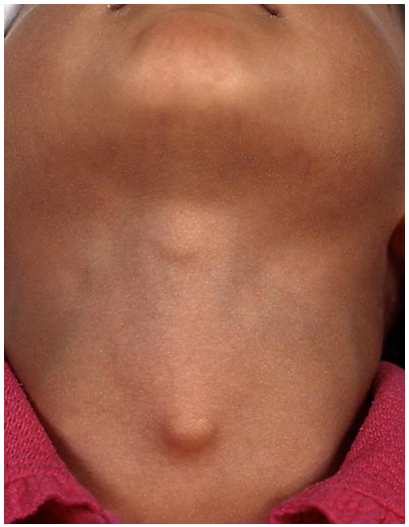
Majority are benign, but need to be concerned about potential malignancy
Common benign process: cysts, multinodular glands, adenoma, TGDC

Workup: thyroid /neck US, FNA of any concerning lesions

Pediatric Neck Masses

- Differential diagnosis: inflammatory, congenital, neoplastic
- Majority of neck masses in children are a benign process
- Inflammatory disease is most common cause of neck masses in children
  - Cervical adenitis

- Up to 10-15% of peds neck masses will be malignant
- Location is key factor in determining Ddx



Peds neck mass - history

- duration
  - timing of onset –eg present at birth?
- location
- growth pattern
- associated symptoms
- painful
- recent infections esp URI or sick contacts
- animal bites or scratches
- travel
- family history (malignancy)
- trauma

Fever
Night sweats
Fatigue
Weight loss
Easy bruising

Neck mass - exam

Location helps guide differential dx

- Lateral neck most common site for metastatic disease from UADT
  - upper neck anterior/deep to SCM
- Midline neck masses likely related to thyroid, elevates with swallowing

Concerning features:

- any abnormality in other area of head and neck
  - skin/scalp/ear lesions, mucosal lesion of nasal cavity, oral cavity, pharynx, larynx

- enlarging or hard mass
- fixation to surrounding structures (skin, SCM, mandible)
- single, asymmetric node/mass ~ > 2 cm
- mass in supraclavicular fossa or parotid
- neurologic abnormalities (cranial nerves)
- multiple rapidly growing nodes may suggest lymphoma

Concern for abscess warrants referral to ENT possible I & D

Pediatric neck masses

Reactive adenopathy from viral or bacterial illness → most common cause

The majority of inflammatory lesions are self-limited and will resolve with conservative therapy

- B cervical lymph nodes, node size < 3cm, decreasing size, not significantly tender or erythematous → may be treated with observation

Long, et al. Principles and practice of pediatric infectious disease, 2nd ed. 2003

Srouji IA et al Int J Pediatr Oto 2004;68(5):551-56

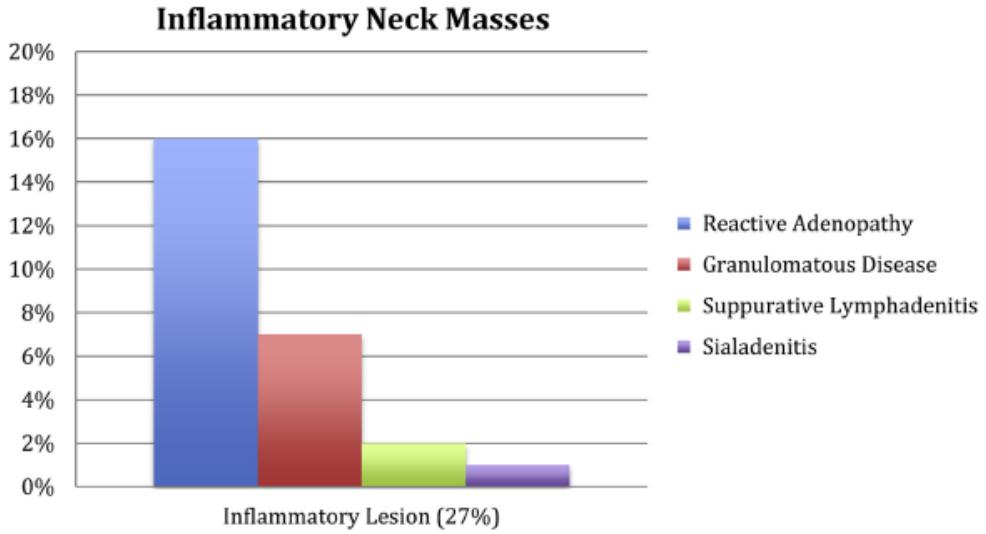
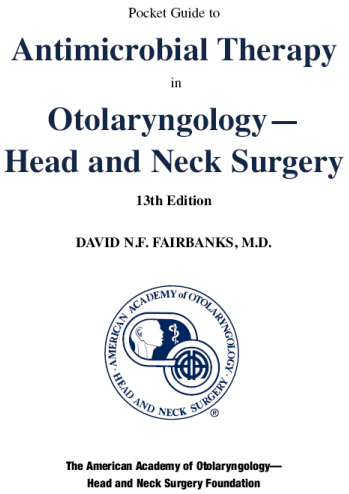


Fig. 16. Inflammatory neck masses of the neck in children. (*Data from* Torsiglieri AJ Jr, Tom LW, Ross AJ 3rd, et al. Pediatric neck masses: guidelines for evaluation. Int J Pediatr Otorhinolaryngol 1988;16(3):199–210.)

Antibiotic guidelines

Suggest empiric treatment with antibiotics for :

- pts with failure to regress ~4-wks
- pts without systemic symptoms
- node < 2-3 cm
- unilateral adenopathy
- associated erythema and tenderness



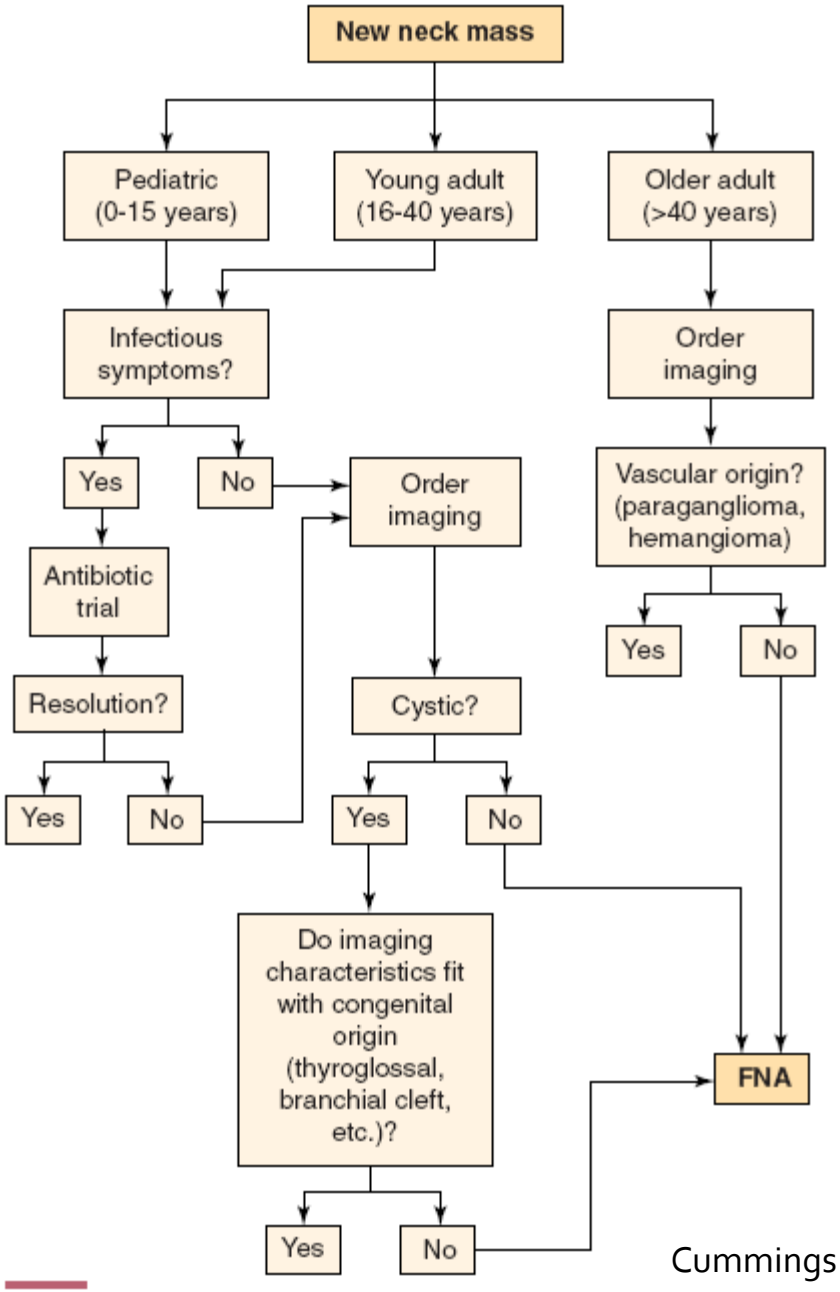
S. aureus and group A strep most common pathogens
10 day course of Cephalexin, amoxicillin/clavulanate, or clindamycin

IF:

- no decrease in size after 4-6 weeks
- or after appropriate abx course
- or signs of abscess formation or ulceration
- or matted/rubbery nodes without inflammation
- Or other concerning findings,

→ for biopsy or surgical excision, other evaluation

Long, et al. Principles and practice of pediatric infectious disease, 2nd ed. 2003
Torsiglieri , et al. Int J Pediatr Otol 1988;16(3);199-210
Dulin, et al. Am Fam Physician 2008;78(9);1097-98



Cummings et al. Otolaryngology-HNS, 5th ed

Figure 116-2. Diagnostic schema for a new neck mass.

Peds neck mass - Evaluation

Imaging Studies

- Ultrasound
  - Allows differentiation between solid vs cystic
  - Assess normal thyroid tissue location in TGDC
- CT with contrast
  - Allows differentiation between phlegmon and abscess
  - Better anatomic detail, surgical planning
- MRI
  - Ideally suited for soft-tissue evaluation (ie vascular malformations)

Lab Studies

Can be useful particularly if malignancy or systemic infection suspected

- CBC
- ESR
- Ca if suspect sarcoidosis
- PPD
- Serology
  - EBV, CMV, cat-scratch disease, monospot
- FNA
  - For culture, histopathology

Peds neck mass

Indications for referral:

- Concern for neoplasm/malignancy
  - supraclavicular mass, posterior triangle mass
  - enlarging mass, size > 2cm
  - B symptoms without signs of associated infection
- Concern for congenital lesion
  - midline or lateral mass
- Concern for abscess or atypical infectious/inflammatory lesion
  - persistent, unilateral adenopathy
  - no resolution after single course of broad spectrum antibiotic
- Neck mass duration > 6 weeks

Lymphoma is most common malignancy that presents as a neck mass in children

Pediatric neck masses

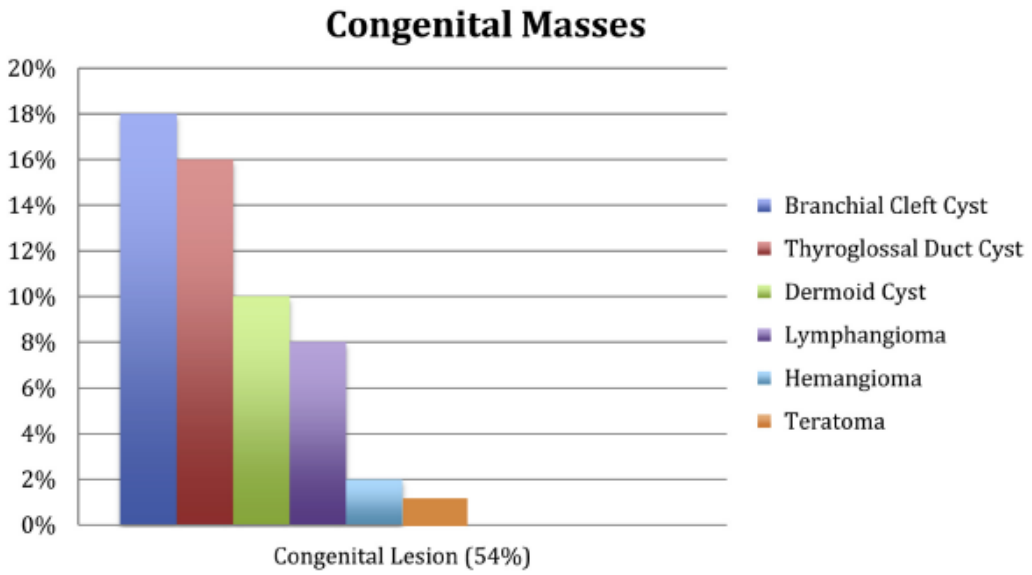
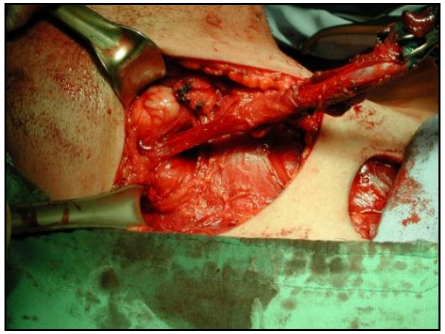


Fig. 2. Categories of congenital neck masses in children. (*Data from* Torsiglieri AJ Jr, Tom LW, Ross AJ 3rd, et al. Pediatric neck masses: guidelines for evaluation. Int J Pediatr Otorhinolaryngol 1988;16(3):199–210.)

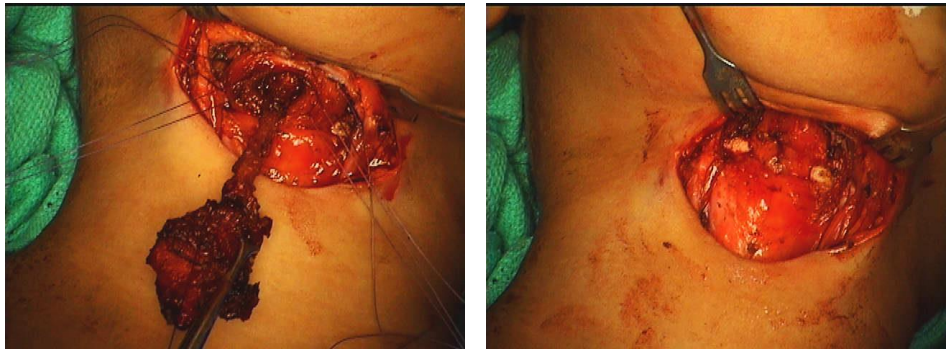
Congenital neck masses

Second Branchial Cleft Sinus

Thyroglossal duct cyst



Excision of entire cyst tract

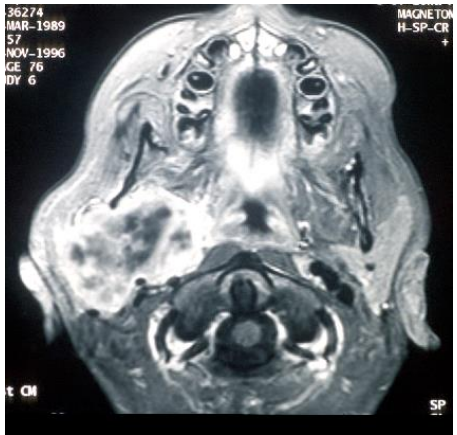


Excision of entire cyst tract including medial hyoid bone

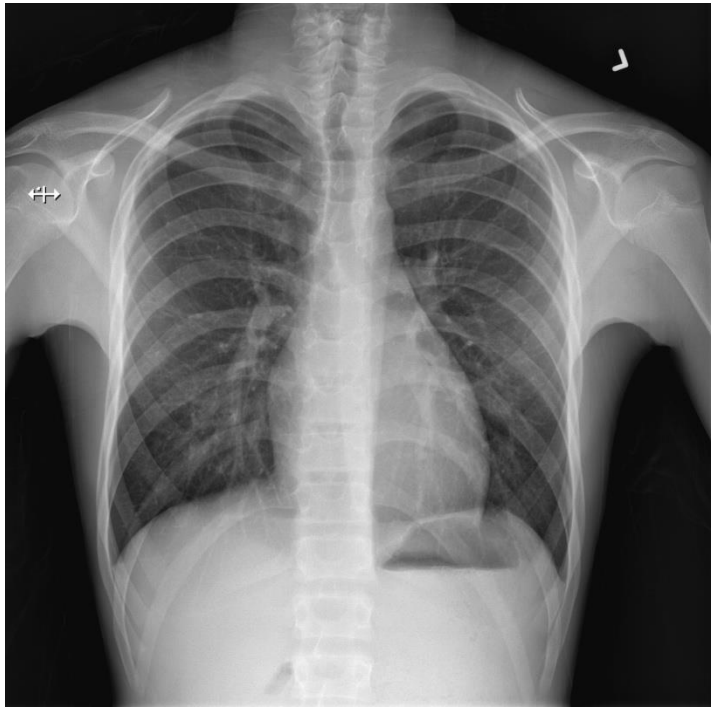
Parotid mass

7 yo with R parotid mass for 6 weeks, not responsive to 7 days of abx, low grade fevers, firm mass with central fluctuance, some tenderness, adjacent erythema and induration, normal facial nerve function

7 yo with R parotid mass for 6 weeks, not responsive to 7 days of abx, afebrile, no pain, firm mass with normal overlying skin, normal facial nerve function



Pediatric neck mass



14 yo healthy male presents with DOE,
CXR obtained showing R deviation of trachea

US obtained showing ~ 3.5 cm solid nodule in L thyroid lobe

FNA obtained showing follicular neoplasm

Underwent hemithyroidectomy showing Follicular variant of papillary thryoid cancer

Neck mass

- Do not observe neck mass for > 2-4 wks in adult, > 6 wks in peds
  - Peds LN > 2-3 cm, adult LN/mass size >1.5 cm

- CT scan with contrast and FNA of mass are most useful dx tools, helpful if done before referral
  - U/S better than CT if pediatric patient or thyroid mass